Fact Sheet

Nutrition, Physical Activity and Achievement

The facts are in: poor nutrition and lack of physical activity lead to lower academic achievement. Study after study proves what educators have long believed to be true: when children's basic nutritional and fitness needs are met, they have the cognitive energy to learn and achieve. Schools continue to be a core place for students to learn and practice healthy eating habits, and can also be a primary place to gain the knowledge, motivation, and skills children need for lifelong physical activity [1].

Poor nutrition hampers academic achievement.

Recent studies demonstrate:

- In a New York study, many students experienced malnutrition that was too slight for clinical signs yet still affected their intelligence and academic performance. This impairment can be corrected through improved nutrition [2], [3].
- Among fourth grade students, those having the *lowest amount of protein* in their diet had the *lowest achievement scores* [4].
- *Iron deficiency anemia* leads to *shortened attention span, irritability, fatigue, and difficulty with concentration*. Consequently, anemic children tend to do poorly on vocabulary, reading, and other tests [5].
- Children who suffer from *poor nutrition* during the brain's most formative years score much *lower on tests of vocabulary, reading comprehension, arithmetic*, and general knowledge [6].
- Six- to eleven-year-old *children from food-insufficient families* had significantly *lower arithmetic scores* and were more likely to have *repeated a grade.* Families were classified as food-deficient if they self-reported as sometimes or often not having enough food to eat. In addition, food-insufficient teenagers were more likely to have been *suspended from school,* and children in this category were more likely to have seen a psychologist and to have experienced *difficulty interacting with their peers* [7].
- Even *moderate under-nutrition (inadequate or sub-optimal nutrient intake)* can have lasting effects and *compromise cognitive development and school performance* [8].
- Morning fasting has a negative effect on cognitive performance, even among healthy, well-nourished children. A test of the speed and accuracy of response on problem-solving tasks given to children who did or did not eat breakfast found that *skipping breakfast had an adverse influence on their performance on the tests* [9].

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Proper nutrition enhances academic performance.
School Breakfast Programs are especially effective in increasing child nutrition and enhancing academic performance.

Participation in a School Breakfast Program:

- Relieves hunger and improves children's ability to succeed at school [10],[11];
- Increases intake of food energy, calcium, phosphorous, and vitamin C [12];
- Improves school performance and reduces absenteeism and tardiness [13];
- Improves academic, behavioral, and emotional functioning [14];
- Leads to increased math grades, lowered absenteeism, and improved behavior [15];
- Increases composite math and reading scores, improves student behavior, reduces morning trips to the nurse, and increases student attendance and test scores [16];
- Strengthens children's psychosocial outcomes, lowering anxiety, hyperactivity, depression, and psychosocial dysfunction [17];
- Raises scores on basic skills tests and reduces tardiness and absenteeism among participants [18].

Across the nation, physical education programs are on the decline.

- From 1991 to 1999, the percentage of students who attended daily physical education classes declined from 42% to 29% [19].
- The majority of high school students take physical education for only one year between 9^{th} and 12^{th} grades [20].

Increased physical activity leads to higher academic achievement.

Recent studies show:

- Providing more opportunity for increased physical activity (by reducing class time) leads to increased test scores. A reduction of 240 minutes per week in class time for academics to enable increased physical activity led to consistently higher mathematics scores [21], [22].
- Intense physical activity programs have positive effects on academic achievement, including increased concentration; improved mathematics, reading, and writing test scores; and reduced disruptive behavior. Academic achievement improves even when the physical education reduces the time for academics [23].
- Aerobic conditioning may help to improve memory. Exercise may strengthen particular areas of the brain, and oxygen intake during exercise may enhance greater connections between neurons [24].

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The links between child nutrition, physical activity, and achievement will be one of the topics addressed at the **Healthy Schools Summit: Taking Action for Children's Nutrition and Fitness**. The Summit will be held in Washington, D.C., on October 7 and 8, 2002. Chaired by former U.S. Surgeon General David Satcher, MD, PhD, the Summit will kick off nationwide initiatives to improve children's health. Action for Healthy Kids State Teams will work together before, during, and after the Summit to create healthy school environments. For further information about the **Healthy Schools Summit**, and to learn about ways to become involved in your Action for Healthy Kids State Team, visit the **Action for Healthy Kids** website at http://www.ActionForHealthyKids.org.

Sources: [1] Bogden, J.F. *Fit, healthy, and ready to learn: a school health policy guide.* Alexandria (VA): NASBE, 2000; [2] Schoenthaler, S. Abstracts of early papers on the effects of vitamin-mineral supplementation on IQ and behavior. *Personality and Individual Differences* 1991;12(4):343; [3] Schoenthaler, S., Amos, S., Eysenck, H., Peritz, E., and Yudkin, J. Controlled trial of vitamin mineral supplementation: effects on intelligence and performance. *Personality and Individual Differences* 1991;12(4):361; [4] American School Food Service Association (ASFSA). Impact of hunger and malnutrition on student achievement. *School Board Food Service Research Review* 1989;(1,Spring):17-21; [5] Parker, L. *The relationship between nutrition and learning: a school employee's guide to information and action.* Washington: National Education Association, 1989; [6] Brown, L., Pollitt, E. Malnutrition, poverty and intellectual development. *Scientific American* 1996;274(2):38-43; [7] Alaimo, K., Olson, C.M., Frongillo Jr., E.A. Food insufficiency and American school-aged children's cognitive, academic, and psychosocial development. *Pediatrics* July 2001;108(1):44-53; [8] Center on Hunger, Poverty, and Nutrition Policy. Statement on the Link between Nutrition and Cognitive Development in Children. Medford, MA: Tufts University School of Nutrition 1995; [9] Pollitt, E., Leibel, R., Greenfield, D. Brief fasting, stress, and cognition in children. *American Journal of Clinical Nutrition* 1991;34(Aug):1526-1533; [10] Murphy, J.M., Pagano, M.E., Nachmani, J., Sperling, P., Kane, S., Kleinman, R.E. The relationship of school breakfast to psychosocial and academic functioning. *Archives of Pediatrics and Adolescent Medicine* 1998;152:899-906; [11] Kleinman, R.E. et al., Hunger in children in the United States: potential behavioral and emotional correlates. *Pediatrics* 1998;101(1):E3. [12] Mathematica Policy Research. Children's diets in the mid-1990s: dietary intake and its relationship with school meal participation. Final report to USDA 2001; [13] Office of Research, Education, and the Center for Nutrition Policy and Promotion, USDA. *American Journal of Clinical Nutrition* 1998;67(4):798S-803S; [14] U.S. Department of Health and Human Services. Guidelines for school health programs to promote lifelong healthy eating. *Morbidity and Mortality Weekly Report Recommendations and Report* 1996 Jun 14; 45:RR-9; [15] Barnard, A. Study links school breakfast, results. *Boston Globe* 2000 Nov 29; [16] Minnesota Department of Children Families and Learning. *School breakfast programs energizing the classroom* 1998; [17] Murphy, J.M. et al. Effects of a universally free, in-classroom school breakfast program: results from the Maryland Meals for Achievement Evaluation. Initial Report 1999 May 4; [18] Meyers, A.F. et al. School breakfast program and school performance. *American Journal of Diseases of Children* 1989;143:1234–9; [19] Centers for Disease Control. Physical activity and good nutrition: essential elements to prevent chronic diseases and obesity. *At a Glance* 2002; [20] NASPE, Executive Summary, *Shape of the Nation* 2001; [21] Shephard, R.J., Volle, M., Lavalee, M., LaBarre, R., Jequier, J.C., Rajic, M. Required physical activity and academic grades: a controlled longitudinal study. In: Limarinen and Valimaki, editors. *Children and Sport.* Berlin: Springer Verlag; 1984. 58-63; [22] Shephard, R.J. Curricular physical activity and academic performance. *Pediatric Exercise Science* 1997;9:113-126; [23] Symons,C.W., Cinelli, B., James, T.C., Groff, P. Bridging student health risks and academic achievement through comprehensive school health programs. *Journal of School Health* 1997;67(6):220-227; [24] Jensen 1998.